

ABSTRACT OF THE DISCLOSURE

When a nitride semiconductor monocrystalline wafer is polished, a process-transformed layer is produced. Etching is required in order to remove the process-transformed layer. Being that nitride semiconductor materials are chemically inert, however, suitable etching does not exist. Although potassium hydroxide, for example, or sulfuric acid have been proposed as GaN etchants, their corrosively remove material from the Ga face is weak.

Dry etching utilizing a halogen plasma is carried out in order to remove the process-transformed layer. The Ga face can be etched off with the halogen plasma. Nevertheless, owing to the dry etching, a problem arises again—surface contamination due to metal particles. To address the problem, wet etching with, as the etchant, solutions such as $\text{HF} + \text{H}_2\text{O}_2$, $\text{H}_2\text{SO}_4 + \text{H}_2\text{O}_2$, $\text{HCl} + \text{H}_2\text{O}_2$, or HNO_3 , which have no selectivity, have etching ability, and have an oxidation-reduction potential of 1.2 V or more, is performed.